UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,149	10/27/2003	Akihiro Ito	16869N-018910US	6442

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ABEL JALIL, NEVEEN

ART UNIT	PAPER NUMBER
2165	

DATE MAILED: 03/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/695,149	ITO ET AL.
	Examiner	**Art Unit**	
	Neveen Abel-Jalil	2165	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>2/13/2006</u>.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>24-43</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>24-28,33-36 and 39-41</u> is/are rejected.

7) ☒ Claim(s) <u>29-32,37,38,42 and 43</u> is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☒ Certified copies of the priority documents have been received in Application No. <u>09/746,608</u>.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>1/20/06</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

DETAILED ACTION

Remarks

1.   The Amendment filed on February 13, 2006 has been received and entered.

Claims 24-43 are pending.

2.   Acknowledgment is hereby made for the amended abstract.

Terminal Disclaimer

3.   The terminal disclaimer filed on February 13, 2006 disclaiming the terminal

portion of any patent granted on this application which would extend beyond the

expiration date of US Patent No. 6,654,769 B2 has been reviewed and is accepted. The

terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 24-28, 33-36, and 39-41 are rejected under 35 U.S.C. 103(a) as being

unpatentable over <u>Wolff</u> (U.S. Patent No. 6,185,601) in view of <u>Jantz</u> (U.S. Patent No.

5,944,838).

As to claim 24, <u>Wolff</u> discloses a computer system comprising:

a first node coupled to a physical disk via a first path (See figures 7A, 7B, Nodes 1-4);

a second node coupled to said physical disk via a second path (See figures 7A, 7B, Nodes 1-4), said second node being coupled to said first node via a network (See figure 1B, 108, shows "network" represented by "Public LAN/WAN"); and

a physical disk connecting to a first disk controller and to a second disk controller (See figure 5A, Node 1-N), said first disk controller being coupled to said first node via said first path, said second disk controller being coupled to said second node via said second path (See column 2, lines 3-13, wherein "physical disk device" reads on "resource"), each of said first node and said second node comprising:

a file management table (See figure 14, 1458, 1460, shows "file management table" represented by "file record" and "file location record") including a file ID (See figure 8, 460, 462, shows "file ID" represented by "File location record" and Dev ID") and a logical disk ID of a logical disk, said logical disk being a storage area in said physical disk and storing a file corresponding to said file ID (See figure 8, 460, 462, shows "file ID" represented by "File Location record" and "Dev ID"); and

a logical disk management table including said logical disk ID (See figure 8, 460, 462, shows "file ID" represented by "File Location record" and "Dev ID"), a first path information designating said first path, and a second path information designating said second path (See column 18, lines 50-53), said first path information including a first node ID designating said first node and first status information designating status of said first path, and said second path information includes a second node ID designating said second node and second status information designating status of said second path (See

column 2, lines 3-13, wherein "physical disk device" reads on "resource", also see

column 23, lines 53-60, wherein "status flag" reads on "marked"),

each of said first node and said second node configured to select a path for

accessing said logical disk (See column 18, lines 63-67, also see column 19, lines 1-12,

wherein "logical disk" reads on "namespace"), if it receives an access request including

said file ID, said path being selected based on said received file ID, said file management

table, and said logical disk management table (See figure 8, 460, 462, shows "file ID"

represented by "File Location record" and "Dev ID", also see column 56, lines 18-28,

wherein "logical disk ID" reads on "logical file names"),

wherein when said first path becomes unavailable (See column 23, lines 42-60,

wherein "unavailable" reads on " marked as failed"), said first node configured to

respond by:

changing said first status information and said second status information in said

logical disk management table in order to change an access path to said logical disk (See

column 31, lines 55-63, wherein "logical disk management table" reads on "database of

available resources" and wherein "logical disk ID" reads on "namespace"); and

sending said logical disk ID, said changed first path information, and said

changed second path information to other nodes coupled to said network (See column 31,

lines 55-63, wherein "logical disk ID" reads on "namespace").

Wolff teaches the claimed invention except for a disk driver for performing disk

I/O processing;

wherein when said disk driver determines that said first path becomes unavailable.

Jantz teaches a disk driver for performing disk I/O processing (See Jantz column 3, lines 15-35);

wherein when said disk driver determines that said first path becomes unavailable (See Jantz column 3, lines 15-35).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Wolff with the teachings of Jantz to include a disk driver for performing disk I/O processing because it is well known in the art a disk driver carries the functionality of processing and determining available I/O paths to be implemented on the host to provides fault tolerance and redirection to reduce latency time (See Jantz column 3, lines 38-40).

As to claim 25, Wolff discloses wherein said first node includes a first input/output (I/O) interface via which said first node is coupled to said first disk controller, and said second node includes a second I/O interface via which said second node is coupled to said second disk controller (See column 57, lines 10-13, also see column 18, lines 31-43, also see column 23, lines 34-41, also see column 57, lines 8-17, wherein "first and second controller" reads on "each device driver handles one device type"),

wherein said first path information further includes a first disk controller ID designating said first disk controller, and a first I/O interface ID designating said first I/O interface h (See column 54, lines 45-63, wherein "disk controller" reads on "control", also see column 2, lines 53-67),

wherein said second path information further includes a second disk controller ID

designating said second disk controller (See column 57, lines 8-17, wherein "controller

ID" reads on "each device driver handles one device type"), and a second I/O interface

ID designating said second I/O interface (See figure 10F, 1200, I/O A, and figure 10G,

1300, I/O B, also see column 16, lines 41-42).

As to claim 26, Wolff discloses further comprising a third node coupled to said

first node and said second node via said network (See figure 5A, Node1-N, also see

column 1, lines 61-66), said third node including said file management table and said

logical disk management table (See column 31, lines 55-63),

wherein when said third node detects a fault in said first node, said third node

sends said second node a request for changing an access path to said logical disk (See

column 52, lines 28-34, also see column 23, lines 34-41),

said second node changes said first status information and said second status

information in said logical disk management table in order to change an access path to

said logical disk, and sends said logical disk ID, said changed first path information, and

said changed second path information to other nodes coupled to said network (See

column 31, lines 55-63, wherein "status information" reads on "database of available

resources" and wherein "logical disk ID" reads on "namespace"), and

wherein said other nodes (See figures 7A, 7B, Nodes 1-4) can update their

respective logical disk management tables based on data received from said second node

(See column 31, lines 55-63, wherein "logical disk management table" reads on

"database of available resources" and wherein "logical disk ID" reads on "namespace").

As to claim 27, <u>Wolff</u> discloses wherein if an access request issued from one of said other nodes to said logical disk times out, then said one of said other nodes selects an access path to said logical disk based on its updated logical disk management table (See column 56, lines 34-54, wherein "time out" reads on "scheduling", also see column 23, lines 53-60).

As to claim 28, <u>Wolff</u> discloses wherein when said third node detects a fault in said first node, said third node selects a path which becomes unavailable and a corresponding path whose status is waiting (See column 23, lines 53-60, wherein "status" reads on "marked", also see column 23, lines 42-60, wherein "unavailable" reads on " marked as failed"), and

said third node sends said request for changing an access path to said second node (See column 66, lines 23-25, wherein "user" reads on "client"), said second node is coupled to said logical disk via said corresponding path (See column 28, lines 3-19, wherein "switch" reads on "redistribution").

As to claim 33, <u>Wolff</u> discloses wherein each of said first node and said second node (See figure 5A, Node1-N) further includes a buffer cache for storing data to be written into said logical disk (See column 31, lines 55-63, wherein "logical disk" reads on namespace"), and

when said first path becomes unavailable before storing data from said buffer cache of said first node into said logical disk, said first node sends said data to said

second node, and said second node stores said data into said logical disk via said second

path (See column 23, lines 42-60, wherein "unavailable" reads on " marked as failed").

As to claim 34, <u>Wolff</u> discloses wherein said file management table further

includes file management information which is updated based on a received write request

(See column 6, lines 31-35), when said file management information is updated, each of

said first node and said second node stores said file management table into said physical

disk (See column 43, lines 14-21, also see column 44, lines 1-21, also see column 2, lines

3-13, wherein "physical disk devise" reads on "resource"), and

when said first path becomes unavailable before said updated file management

table in said first node is stored into said physical disk, said first node sends data in said

updated file management table to said second node, and said second node writes said

received data into said physical disk (See column 58, lines 1-7, also see column 1, lines

61-66, wherein "physical disk devices" reads on "resource on the network", also see

column 31, lines 55-63).

As to claim 35, <u>Wolff</u> discloses wherein each of said first disk controller and said

second disk controller includes a disk cache for storing data to be stored in said physical

disk (See column 57, lines 8-17, wherein "firs and second controller" reads on "each

device driver handles one device type"), and

when said first path becomes unavailable before data stored in said disk cache of

said first disk controller is stored in said physical disk (See column 23, lines 42-60,

wherein "unavailable" reads on " marked as failed"), said second node issues a command

for writing said data in said disk cache into said physical disk via said second disk (See

column 59, lines 15-28, wherein "physical disk device" reads on "volume" and wherein

"operational" reads on "to have read/write access").

As to claim 36, Wolff discloses a first node coupled to a second node via a

network comprising:

first I/O interface (See figure 10F, 1200, I/O A, and figure 10G, 1300, I/O B, also

see column 16, lines 41-42) for coupling to a physical disk via a first disk controller, said

physical disk coupled to said second node via a second disk controller and a second

interface (See column 57, lines 8-17, wherein "first disk controller" reads on "each

device driver handles one device type");

a file management table (See figure 14, 1458, 1460, shows "file management

table" represented by "file record" and "file location record") including a file ID (See

figure 8, 460, 462, shows "file ID" represented by "File location record" and Dev ID")

and a logical disk ID of a logical disk, said logical disk being a storage area in said

physical disk and storing a file corresponding to said file ID (See figure 8, 460, 462,

shows "file ID" represented by "File Location record" and Dev ID"); and

a logical disk management table including said logical disk ID (See figure 8, 460,

462, shows "file ID" represented by "File Location record" and Dev ID"), a first path

information designating a first path through said first node, and a second path information

designating a second path through said second node, each of said first path information

and said second path information including a node ID designating a node on said path,

and a status information designating availability of said path (See column 18, lines 37-43,

wherein "standby" reads on "be used in the future", also see column 2, lines 53-67),

wherein when said status information of said first path is available and said status

information of said second path is waiting (See column 18, lines 31-43, also see column

18, lines 50-53), said first node selects said first path for accessing a file designated by

said file ID which is included in an access request (See column 66, lines 23-25, wherein

"user" reads on "client", also see column 65, lines 1-7, wherein "file ID" reads on

"pointer"),

wherein when said first path becomes unavailable, said first node changes said

status information of said first path to unavailable, changes said status information of said

second path to available, and sends said logical disk ID, a changed first path information,

and a changed second path information to said second node in order to change a path

used for accessing said logical disk (See column 58, lines 1-7, also see column 1, lines

61-66, wherein "available devices" reads on "resource on the network", also see figure

11A, labeled Prior Art, also see column 55, lines 37-45, wherein "buffer cache" reads on

"client").

Wolff teaches the claimed invention except for a disk driver to perform I/O

processing with said physical disk;

wherein when said disk driver detects that said first path becomes unavailable.

Jantz teaches a disk driver to perform I/O operations with said physical disk (See

Jantz column 3, lines 15-35);

wherein when said disk driver detects that said first path becomes unavailable

(See Jantz column 3, lines 15-35).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to modify the teachings of Wolff with the teachings of Jantz to

include a disk driver for performing disk I/O processing because it is well known in the

art a disk driver carries the functionality of performing I/O operations and detecting

available I/O paths to be implemented on the host to provides fault tolerance and

redirection to reduce latency time (See Jantz column 3, lines 38-40).

As to claim 39, Wolff discloses wherein said first node further comprises a buffer

cache for storing data to be written into said logical disk,

wherein when said first path becomes unavailable before storing data stored in

said buffer cache into said logical disk, said first node sends said data to said second node

to store said data into said logical disk via said second path (See column 58, lines 1-7,

also see column 1, lines 61-66, wherein "available devices" reads on "resource on the

network", also see figure 11A, labeled Prior Art, also see column 55, lines 37-45,

wherein "buffer cache" reads on "client", also see column 67, lines 9-18, wherein

"unavailable" reads on "logged off").

As to claim 40, Wolff discloses wherein said file management table further

includes file management information which is updated based on a received write

request,

wherein when said file management information is updated, said first node stores

said file management table into said physical disk (See column 58, lines 1-7, also see

column 1, lines 61-66, wherein "physical disk devices" reads on "resource on the

network"), and

wherein when said first path becomes unavailable before said updated file

management table is stored into said physical disk, said first node sends data in said

updated file management table to said second node to store said data into said physical

disk via said second path (See column 58, lines 1-7, also see column 1, lines 61-66,

wherein "physical disk devices" reads on "resource on the network").

As to claim 41, Wolff discloses a second node coupled to a first node via a

network comprising:

a second I/O interface (See figure 10F, 1200, I/O A, and figure 10G, 1300, I/O B,

also see column 16, lines 41-42) for coupling to a physical disk via a second disk

controller, said physical disk being coupled to said first node via a first disk controller

and a first I/O interface (See column 58, lines 1-7, also see column 1, lines 61-66,

wherein "physical disk devices" reads on "resource on the network");

a file management table including a file ID and a logical disk ID of a logical disk

(See column 9, lines 58-61, wherein "logical disk reads on "logical resource"), said

logical disk being a storage area in said physical disk and storing a file corresponding to

said file ID (See column 6, lines 42-50, also see column 31, lines 55-63, wherein "logical

disk ID" reads on "namespace"); and

a logical disk management table including said logical disk ID (See column 17,

lines 19-28), a first path information designating a first path to said logical disk through

said first node, and a second path information designating a second path to said logical

disk through said second node (See figure 1B, 108, shows "network" represented by "Public LAN/WAN"), each of said first path information and said second path information including a node ID designating a node on said path, and a status information designating availability of said path (See figure 11A, labeled prior art, wherein "remote node" reads on "client A" and "client B", also see column 18, lines 37-43, wherein "standby" reads on "be used in the future"),

wherein when said status information of said first path is available and said status information of said second path is waiting, said second node receives an access request including said file ID (See figure 8, 460, 462, shows "file ID" represented by "File Location record" and Dev ID", also see column 31, lines 52-63, wherein "waiting" reads on "configuration subroutine of available resources and paths") and transfers said access request to said first node via said network thereby accessing said logical disk through said first path, wherein when said first path becomes unavailable (See figure 11A, labeled Prior Art, wherein "node" reads on "client A" and "client B" and also see column 55, lines 37-45, wherein "node" reads on "clients"), said second node changes said status information of said first path to unavailable and changes said status information of said second path to available in order to change a path used for accessing said logical disk (See column 58, lines 1-7, also see column 1, lines 61-66, wherein "available devices" reads on "resource on the network", also see column 67, lines 9-18, wherein "unavailable" reads on "logged off").

Wolff teaches the claimed invention except for a disk driver to perform I/O processing with said physical disk;

wherein when said disk driver detects that said first path becomes unavailable.

Jantz teaches a disk driver to perform I/O processing with said physical disk (See

Jantz column 3, lines 15-35);

wherein when said disk driver detects that said first path becomes unavailable

(See Jantz column 3, lines 15-35).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to modify the teachings of Wolff with the teachings of Jantz to

include a disk driver for performing disk I/O processing because it is well known in the

art a disk driver carries the functionality of processing and detecting available I/O paths

to be implemented on the host to provides fault tolerance and redirection to reduce

latency time (See Jantz column 3, lines 38-40).

Allowable Subject Matter

6.   Claims 29-32, 37-38, and 42-43 would be allowable if rewritten to overcome the

rejection(s) under Double Patenting, set forth in this Office action and to include all of

the limitations of the base claim and any intervening claims.

Response to Arguments

7.   Applicant's arguments with respect to claims 24-43 have been considered but are

moot in view of the new ground(s) of rejection.

Conclusion

8.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

advisory action. In no event, however, will the statutory period for reply expire later than

SIX MONTHS from the date of this final action.

9.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Neveen Abel-Jalil whose telephone number is 571-272-

4074. The examiner can normally be reached on 8:30AM-5:30PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Jeffrey A. Gaffin can be reached on 571-272-4146. The fax phone number

for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status

information for unpublished applications is available through Private PAIR only. For

more information about the PAIR system, see http://pair-direct.uspto.gov. Should you

have questions on access to the Private PAIR system, contact the Electronic Business

Center (EBC) at 866-217-9197 (toll-free).

Neveen Abel-Jalil
February 23, 2006

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SUPERVISORY PATENT EXAMINER
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